In the Claims:

Please amend the claims as follows:

1. (currently amended) A method to increase ~~the~~ a safety integrity level of a single controller for control of real world objects, the method comprising:

attaching to the single controller a safety-hardware unit wherein the ~~safety-hardware~~ safety-hardware unit communicates with a central processing unit of the single controller,

downloading safety-related configuration data and/or diagnostic information to the attached safety-hardware unit and downloading ~~the~~ a control function software to the single controller,

configuring the attached safety-hardware unit to execute logic, which depends on the downloaded safety-related configuration data and/or diagnostic information, and

actively or passively setting ~~in an active or passive way set~~ output values of the single controller to a safe state for online safety control.

2. (previously amended) The method according to claim 1, wherein the controller has the capability of executing a set of non-safety critical control functions, which set of non-safety critical control functions is the same before as well as after the safety hardware unit is attached.

3. (previously amended) The method according to claim 2, wherein the configuring comprises:

downloading to the attached safety hardware unit diagnostic information, which

previously was automatically generated by a software tool as a result of user's configuration of the controller and which diagnostic information is used in the attached safety hardware unit during safety critical control.

4. (previously amended) The method according to claim 1, wherein access to a plurality of input and output values of a real world object is obtained through a bus connected between the controller and to an input/output unit and the validity of the bus communication is verified in the attached safety hardware unit.

5. (previously amended) The method according to claim 1, wherein the timing supervision of the controller is verified in the attached safety hardware unit.

6. (previously amended) The method according to claim 1, wherein correct sequence of code logic is verified in the attached safety hardware unit.

7. (previously amended) The method according to claim 1, wherein correctness of memory content of the controller is verified in the attached safety hardware unit.

8. (previously amended) The method according to claim 1, wherein a download of new control functionality logic to the controller is verified in the attached safety hardware unit.

9. (previously amended) The method according to claim 1, wherein the attached safety hardware unit performs checks in order to allow only users logged on as safety classified

engineers and safety classified operators to modify the control functionality logic and parameters.

10. (previously amended) The method according to claim 4, wherein the bus communication verification logic in the attached safety hardware unit is implemented diverse.

11. (previously amended) The method according to claim 4, wherein the attached safety hardware unit is diverse generating a safety related header for the bus communication.

12. (previously amended) The method according to claim 11, wherein the input/output unit has two diverse implementations each verifying the correctness of the bus traffic and each generating a safety related header for the bus communication.

13. (previously amended) The method according to claim 1, wherein the attached safety hardware unit comprises a first and a second module in a redundant configuration, the second module is updated with data that exists first module at the time of a failure and the second module takes over the safety related control of the control system from the first module if a failure of the first module is detected.

14. (previously amended) The method according to claim 13, wherein the redundant controller unit is attached to the controller, which takes over in case of a failure of a primary controller and the redundant controller unit establish communication with either the active first module or the active second module of the attached safety hardware unit.

15. (currently amended) A single or 1-channel control system intended for safety-related control of real-world objects, comprising:

a single main central processing unit handling ~~the~~ main processes of a controller,

a ~~an attached~~ safety-hardware unit attached to said controller, the safety-hardware unit comprising means to increase ~~the~~ a safety-integrity level of the controller and comprising means to set output values of the controller in a safe state for online safety control.

16. (previously amended) The control system according to claim 15, wherein the controller has the capability of executing a set of non-safety critical control functions, which set of non-safety critical control functions is the same before as well as after the safety hardware unit is attached.

17. (previously amended) The control system according to claim 16, further comprising:

means for downloading to the attached safety hardware unit diagnostic information, which previously was automatically generated by a software tool as a result of user's configuration of the controller and which diagnostic information is used in the attached safety hardware unit during safety critical control.

18. (previously amended) The control system according to claim 17, further comprising:

an input/output unit connected to the controller by a bus and the validity of the bus communication is verified in the attached safety hardware unit.

19. (previously amended) The control system according to claim 18, wherein the bus communication verification logic in the attached safety hardware unit is implemented diverse.

20. (previously amended) The control system according to claim 19, wherein the attached safety hardware unit is diverse generating a safety related header for the bus communication.